SMALL-SCALE MINING OPERATIONS IN ZIMBABWE

OLIVER MAPONGA

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by
Oliver Maponga

Institute of
Mining Research
University of Zimbabwe

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
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Abbreviations and Acronyms Used

1	AAC	Anglo American Corporation
2	AMWUZ	Associated Mine Workers Union of Zimbabwe
3	BGS	British Geological Survey
4	CGME	Chief Government Mining Engineer
5	CMJ	Chamber of Mines Journal
6	EPO	Exclusive Prospecting Order
7	Forex	Foreign Exchange
8	GDP	Gross Domestic Product
9	GCFC	Gross Fixed Capital Formation
10	Geosurvey	Geological Survey Department (Zimbabwe)
11	GM	General Manager
12	GML	Government Metallurgical Laboratory
13	IMR	Institute of Mining Research
14	ITDG	Intermediate Technology Development Group
15	MC	Mining Commissioner
16	MCR	Mining Continuation Reserve
17	MEPP	Mining Export Promotion Programme
18	MMCZ	Minerals Marketing Corporation of Zimbabwe
19	MoM	Ministry of Mines
20	MSSMA	Matabeleland Small Scale Miners Association
21	NEC	National Executive Committee
22	R & D	Research and Development
23	RBZ	Reserve Bank of Zimbabwe
24	RSA	Republic of South Africa
25	RTZ	Rio Tinto Zinc
26	SSMAZ	Small Scale Miners Association of Zimbabwe
27	TNC	Trans-National Corporation
28	UC	Union Carbide
29	UK	United Kingdom
30	ZCTU	Zimbabwe Congress of Trade Union
31	Zimalloys	Zimbabwe Alloys Ltd
32	Zimasco	Zimbabwe Mining and Smelting Company
33	ZMDC	Zimbabwe Mining Development Corporation

Summary

The Zimbabwean mining sector, although dominated by the large mining companies obtains its success from the numerous small mines which are a common feature in all mining districts. The small scale miners are mainly involved in gold mining including illegal panning for gold along river beds. However, there is a considerable amount of mining on a small scale for other minerals such as beryl, chromite, vermiculite, agate and clay.

Small scale miners are supported by well established government and non-government administrative structures which offer invaluable assistance to the otherwise inexperienced small scale miners. On the fore-front in helping small scale miners is the Ministry of Mines through the departments of: Chief Government Mining Engineer, Government Metallurgical Laboratory, Geological Survey and the Roasting Plant. Other parastatal organisations which offer assistance to small scale miners include; the Institute of Mining Research, Minerals Marketing Corporation of Zimbabwe, Zimbabwe Mining Development Corporation and the Reserve Bank of Zimbabwe.

The Small Scale Miners Association, although a fairly new organisation has been in the fore-front in providing training and expertise to mushrooming small scale miners being assisted in this endeavour by the Intermediate Technology Development Group (UK). The Chamber of Mines, through the District Mining Associations, has also helped the more established small scale miners solve most of their mining problems.

Although the Government has helped small scale miners to a great extent through ZMDC, MMCZ and other departments, there is need to expand these services and make them much more efficient in the discharge of their functions.

1 Introduction

The Mining Sector in Zimbabwe

Mining has long been an important industry in Zimbabwe. The earliest iron smelting sites are dated to the second century AD and the first mention of gold from the east coast of Africa is made by Arab geographers in the tenth century. In the sixteenth century the Portuguese traded gold from the mines of the Munhumutapas in present day Zimbabwe. Almost all gold and copper mines opened this century have been based on ancient mine sites.
European subjugation of the country late last century was not undertaken by Britain, but by a mining company, Cecil John Rhodes' British South Africa Company, in search of the fabled mineral riches of the Great Munhumutapas, thought then to be on the scale of the Witwatersrand gold reefs of South Africa. Deposits of this scale were not discovered but a wide range of smaller mineral occurrences have been found over the years.

Zimbabwe gained independence in 1980. Before that the country had been ruled by a minority settler regime which had unilaterally declared independence from Britain in 1965 leading to an immediate imposition of sanctions by the UN. This period of settler government with the sanctions produced a mining industry that developed in an essentially different way to that of other colonies. Zimbabwe was not developed purely in the interests of the colonising country as a source for raw materials and a market for manufactured goods, but was developed in the interests of a national bourgeoisie, albeit a minority settler one. The settlers had effective control of government from 1923 which resulted in a type of development more similar to that of South Africa than, say, Zambia or Zaire. The imposition of sanctions also had a profound effect on the mode of development by way of forcing national self-sufficiency in a large variety of products.

These factors resulted in several strategies regarding the mining industry both in terms of primary, secondary and tertiary sectors. The shortage of foreign exchange, sanctions and the land-locked position of the country provoked a downstream development of the mining industMry in order to increase value and decrease weight/ volume. Most of the major metals produced are reduced to their pure form. Examples are copper cathodes, nickel cathodes, ferro-chrome, pure tin and iron and steel.

Processing and refining of minerals was also necessary for import substitution for the metal inputs to industry as a whole (eg. copper for wire and cables). Also, several minerals are mined on a small scale purely as inputs for local industry (eg. pyrites for sulphur, apatite for phosphates and bauxite for aluminium sulphate). On the secondary and tertiary sector side, a wide variety of inputs to the mining industry are manufactured locally. Mining equipment such as ball mills, conveyors, rail and rolling stock, pumps, headgear, ventilation ducting and electrical equipment are made in the country.

Another effect of sanctions was that during UDI the TNCs had difficulty in repatriating their profits which meant that surplus generated by the mining industry was often reinvested in the industry or other parts of the economy. This also had the effect of increasing the overall control of the TNC's over the economy as a whole. The major transnational mining houses today have significant holdings in other sectors of the economy. For instance, the AAC has interests in manufacturing, farming, services and finance. Lonrho also has holdings in vehicle manufacture, forestry and textiles, while RTZ has a local engineering subsidiary manufacturing agricultural equipment (Tinto Industries). The original capital generally came from abroad but later investment was mainly raised locally.

Today Zimbabwe mines a wide variety of minerals (over forty). The total value of mineral production in 1989 was 1,195 MZD (about 570 MUSD) excluding the value of ferro-chrome, pig iron, steel, cement, ceramics and coke. In the same year the principal minerals produced, by value, were gold, nickel, asbestos, coal, copper, chromite, iron ore, tin, limestone and phosphate rock, in that order.

Mineral exports in 1987 totalled 1,032 MZD representing 43.5% of total exports and averaged 42% for the period 1980-87, roughly the same percentage as agricultural exports. The principal foreign exchange earners in 1987 were gold (19% of total exports), ferro-chrome (11%), asbestos (4%), nickel (4%), raw steel (2%) and copper (2%). Mining and quarrying contributed 9.6% of the GDP in 1975 but had fallen to 6% by 1987, a slight increase over the low of 4% in 1982 during the height of the recession.

The mining sector's contribution to gross fixed capital formation (GFCF) fell from 16% in 1980 to 3% in 1985 reflecting falling returns from mining ventures due to depressed world market prices. Investment has since picked up in line with improved mineral prices. Mineral output per miner has remained constant at about 9 kUSD throughout the decade while mining as a proportion of the total formal labour force had fallen from 6.6% in 1980 to 5.2% in 1988. In real (deflated) terms average mining wages remained constant throughout the decade.

The bulk of mineral production in Zimbabwe is exported, growth and output of the sector is therefore vulnerable to the vagaries of world mineral prices, as none of the minerals produced are exported in sufficient quantities to exert adequate influence on world price level. Mineral prices therefore are an exogenous variable in determining the sector's performance.

Besides providing basic inputs from which the

manufacturing sector depends on for its supply to the rest of the economy including the mining sector itself, a substantial proportion of the manufacturing sector's exports e.g. ferro-alloys and various iron and steel products originate from the mining sector. The mining sector therefore, provides important forward and backward industrial linkages to the whole economy and its significance need not be underestimated.

Mining in Zimbabwe therefore plays a very important role in employment generation (both skilled, unskilled and semi-skilled), provision of inputs to the manufacturing sector (e.g. phosphates for the fertiliser companies to support the vibrant agricultural sector), enhancing industrial linkages (backward and forward) and the generation of export revenue.

Even though there has been a general decline in the number of people employed in the formal mining industry since 1980, the sector still forms a significant part of the employer structure in Zimbabwe, with the current (1988) total of approximately 57,000 workers. In addition to those formally employed in mining, there are about 10,000 to 15,000 small workers and prospectors who work either as individuals or as small groups illegally.

Although the sector is dominated by the large transnationals or their local subsidiaries, which include Lonrho (UK), Anglo American Corporation (RSA), Rio Tinto-Zinc Corporation (UK) and Turner Newall, small scale mining contributes significantly to overall mineral output and employment in the whole mining sector. The mining industry is largely in the hands of the mining transnational companies, the most important being Anglo American Corporation of South Africa (nickel and ferro-chrome), Union Carbide (ferro-chrome and gold), RTZ plc (gold), Lonrho (gold) and Turner Newall (asbestos). Since independence, state participation has been on the increase. The state has the largest share holding in coal mining, the iron and steel industry (Zisco), tin mining (Kamativi) and in 1984 the newly formed state enterprise, the Zimbabwean Mining Development Corporation (ZMDC) bought out the Zimbabwean mining interests of Messina of South Africa giving it control over most of the national copper and silver production. The state has also set up the Minerals Marketing Corporation of Zimbabwe (MMCZ) which handles all mineral and metal trade with the exception of gold which is bought by the Reserve Bank of Zimbabwe.

The large mining companies operate most of the large mines in the country in terms of labour employed, volume and value of output, while the small scale sector operates relatively smaller but equally important mines. The domination by TNCs means that Zimbabwe cannot obtain all the economic rent from the minerals sector since the companies expect a reasonable share of the rent (acceptable rate of profit) for them to invest. A large indigenous mining sector would therefore increase the share of rent that accrues to the country. Any mention of the Zimbabwean mining sector should therefore include the small scale mining sector which comprises; small workings, micro mines which are operated by individuals, cooperatives, syndicates (business partnership or co-operative of mine owners) and very small local companies. The only large local mining companies are owned by the state through ZMDC and these include Mhangura Copper Mines, Lomagundi Smelting and Mining, Kamativi Tin Mines and Sabi Consolidated Gold Mines.

The aim of this report is to address the principal issues relating to the Zimbabwean small scale mining sector. The paper examines the conditions and circumstances under which the small scale mining sector in Zimbabwe has prospered and highlights any problems encountered

Table 1: Zimbabwe, Basic Mineral Sector Data

(ZD) Unit	1980	1981	1982	1983	1984	1985	1986	1987	1988
GDP Mining MZWD	285	252	217	393	320	335	446	529	629
% GDP, Mining	8	6	4	6	5	5	6	7	7
GFCF, Mining MZWD	83	133	94	86	81	30	55		
% GFCF, Mining	16	16	9	7	7	3	4		
Mineral Prod. MZWD	415	394	383	470	546	630	699	816	986
Min.Prod/cap USD	89	72	66	60	53	48	50	57	62
Min.Exports M	429	354	410	482	585	702	932	1039	
% Mineral Exports	47	36	42	42	40	39	43	44	43
Mining labour k	66	68	64	60	55	55	55	58	58
% mining labour	6.6	6.6	6.1	5.8	5.3	5.2	5.0	5.2	5.2
Min.Prod/lab kUSD	9.9	8.0	7.9	7.7	7.7	7.1	7.7	8.5	9.3
average wage k/an	1.8	2.3	2.8	3.1	3.6	4.1	4.3	4.7	5.2
avg REAL wage k/an	1.8	2.0	2.2	2.0	1.9	2.0	1.9	1.8	1.8

Sources: CSO 1989; Reserve Bank 1989, EIU 1989.

by this sector. Attention will be focused on the support structures in the industry both from the Government and the private sector. At the end of the report an analysis of the socio-economic significance of this sector is undertaken.

Terms of Reference

This report was prepared for IDRC and this was done in compliance with their terms of reference contained in a letter dated 8 January 1990.

Under this contract the consultant shall:

a) Prepare a manuscript collecting all available information on Small Scale Mining (SSM) in Zimbabwe. The manuscript, which should address the needs of donors, planners, and regulators, will contain the following information:

i) data on small operating leases;
ii) characterization of operating leases, (lease ownership, mineral output and socio-economic signifnicance);
iii) description of legal framework
iv) description of available institutional support (who, what for, how?).

The following data on small operating leases should be complied by the consultant:

i) where possible, number of mines with yearly ore output of less than 50,000 tonnes (in case of Chromite, a limit of 6,250 tonnes shall be used) and more than 5,000 tonnes (625 for Chromite);
ii) same but less than 5,000 tonnes per year (625 for chromite);
iii) number of mines in each of the following categories:

Designation	Labour Employed
Micro mine	1 to 5
Very small mine	6 to 20
Small mine	21 to 50

iv) ownership type for each labour category;
v) ore type distribution for each labour and tonnage category
vi) value of output by ore type of micro, very small and small mines:
- Absolute,
- % of country's total production of ore type,
- % of total small-scale minerals output;
vii) social and economic multiplier effect of SSM as compared to large scale "corporate" mining.

b) Present all data, discussions and findings in a camera-ready form for publication as an IDRC manuscript.

c) Submit the report as a draft in five copies prior to finalization. A representative of the consult ant shall avail himself to come to Nairobi to discuss the draft. The draft report must be delivered in Nairobi.

The Small Scale Mining Sector

Introduction

Small scale mining in Zimbabwe can be classified into two broad categories; the formal (legal) and the informal (mainly illegal) mining forms. The latter is that which does not appear in official statistics and consists principally of panning for alluvial gold along river beds and in certain cases small individual mines. The majority of informal small workers are exploiting gold mine dumps using cyanide leaching plants for simple gold extraction, streams and rivers, panning for gold.

The formal sector mines are normally owned by individuals, small syndicates or co-operatives and are formally registered with the Ministry of Mines. Formal sector mines can therefore be classified into three broad categories;

1. mines operated by experienced individuals, generally white Zimbabweans

2. mines operated by unsophisticated individuals, generally black Zimbabweans who have entered the field since independence,

3. mines operated by co-operatives.

Prior to 1980 only 6% of the small mines fell into the latter two categories and most of these were alluvial claims, (as opposed to workings of reef or gold mine dumps). However, by the middle of 1986 the number of the mines in these categories increased to 28% of licensed small mines, while by that time the number of co-operatives had grown from zero to 6%. The number of small miners in the last category now stands at around 75% of the formal (or licenced) small miners in Zimbabwe.

The small scale mining sector represents a segment of the extractive sector with a high potential to create beneficial effects in this country given the beneficial effects so far obtained since independence.

The operation of small scale mines has several peculiar attributes which the large scale mining sector is not endowed with. Firstly, the sector has the ability of utilising small and otherwise unexploitable mineralisations which are not of much interest to TNCs and secondly the sector can absorb less-skilled labour in rural areas and uses scarce and low class capital 'efficiently'. Small-scale mines require modest infrastructure for operation and in addition, the sector also offers opportunities for indigenous entrepreneurial development and advancement and hence contributes to human resources development. The sector also has a low initial investment cost (which suits the usually small miner), a short implementation period and this helps it easily capture any short-term booms in the minerals industry.

Zimbabwe has a large number of small and medium sized mineral deposits, which apparently are not of much interest to the big mining companies. These deposits are exploited by individuals, syndicates, and/or mining cooperatives. Those mineral deposits frequently worked on a small scale basis include gold, chrome, bauxite, beryl, limestone, tantalite and tungsten ores, mica, calcite, feldspar, verdite and tin ores. The small scale miners more often than not are not the owners of claims but do tribute on behalf of the large mining companies and small local private companies. For instance all the twenty-eight mining co-operatives on the Great Dyke either work claims owned by Zimasco (Union Carbide) or those that belong to Zimalloys (Anglo American Corporation). These tributors pay a tributing fee of five dollars (officially) per ton of ore but unfortunately other claim owners charge even higher fees of up to 20 Z$.

The Government has, since independence encouraged the formation of mining co-operatives. Up-to-date there are about 43 registered mining co-operatives which flourish partly through Government aided schemes (through ZMDC).

However, illegal mining, especially gold panning has become a perennial problem in this country and contributes quite extensively to the siltation of the drainage system of the country. Government is doing all within its means to discourage this dangerous practice, dangerous both in human resources and natural resources terms. The Chamber of Mines estimates that between 6,000 and 10,000 miners are occupied during the dry season in illegal gold panning. About half of these miners sell their gold illegally and consequently the Government looses about 15 MZ$ annually in revenue. The number of people involved in gold panning fluctuates a great deal depending on the weather and the crop situation in a particular area.

Characterisation of Small Scale Mining

Introduction

In spite of the frequent use of scale concepts, a universally accepted consensus regarding the definition of the term small-scale and medium-scale mining in quantitative units does not exist. The lack of a general consensus stems from the fact that a number of factors can basically be employed for demarcation purposes, each particularly suitable for a given situation. Generally, definitions are based on one or all of the following criteria which exhibit distinct variances as a result of the scale of operation, these are, labour, output, turnover, degree of mechanisation, labour productivity, size of mining concession or lease and size of reserve.

However, most researchers do agree that output is the only broadly applicable and universally acceptable

measure for delineation of the scale of operation in the mining sector. All the same, while researchers into this field contend that the number of people employed is strongly variable in accordance with the type of operation and the geological features of the deposit, they agree that labour can also be used as a classification base.

In this project only the above two methods of classification have been adopted for comparative purposes. The classification obtained clearly shows that using different criterion one comes up with varied class sizes and mines also do fall in different classes for each method used.

Classification by Labour

The level of employment is not a readily employed method of demarcating the size of mines since labour employed is also a function of degree of mechanisation, type of operation, geological features of the deposit and the size of the mineral deposits. However, regardless of the mentioned problems this method has found wide applicability with most researchers.

Of the 1,464 registered mines at the end of 1988, 186 were either operational or not since they did not declare their level of employment, 105 had level of employment exceeding fifty workers and 598 were presumed shut according to our records. Harare mining district had, as at the end of 1988, 48% (699) of all the registered mines in Zimbabwe. According to the MoM register of mines, in 1988 Harare had 687 mines, followed by Gweru with 332 registered mines, then Bulawayo with 228 mines and Masvingo had the least number of mines with 212 mines. However, in all the mining districts, small gold workings are the dominant class of mines, with Bulawayo having the highest concentration of small gold mines and Masvingo having the least number of gold mines.

A detailed analysis of the distribution of operating mines which declared labour was also done and the results are given below together with the number of mines in each labour category and in each district. However, there are mines which declared output but did not declare their level of employment and these partially invalidate of this method of classification.

Harare mining district boasts the largest number of small mines followed by Masvingo, then Gweru and lastly Bulawayo when the mines are classified using labour. With the exception of Bulawayo micro mines dominate each district. Employment in each labour category was also analysed by district and from the results given below Harare is the largest employer with 1,806 workers employed on the 250 small mines with 802 of these workers in the very small mines category. Gweru is the second largest employer followed by Bulawayo with 1,230 workers and Masvingo is the lowest on small mines. The detailed analysis of labour employed by district and labour category is given below:

Table 2

DISTRIBUTION OF MINES BY DISTRICT AT THE END OF 1988

Designation	Labour Employee	Hre	Byo	Gwe	Mas	Total
Micro	1 to 5	112	30	80	88	310
Very Small	6 to 20	82	40	66	32	220
Small	21 to 50	18	22	17	6	63
Large	> 50	39	20	28	18	105
Total		251	112	191	144	698

Source: IMR Databank

Further to the analysis detailed above, all the mines which declared their level of employment were summed together to give a 'national' classification of mines. However, the classification of the operating mines using labour excludes mines of which information of labour is not available. The group of mines which did not declare employment includes non-operational and operational mines. There were 186 mines which did not declare their labour at the end of 1988 and as a result these could not be placed into appropriate classes. The results of the classification by labour employed are given below for only those that declared labour.

Table 3

BREAKDOWN OF WORKERS EMPLOYED BY DISTRICT AND LABOUR CATEGORY IN 1988

Designation	Labour Employed	Hre	Byo	Gwe	Mas	Total
Micro	1 to 5	367	113	185	258	923
Very Small	6 to 20	802	475	776	290	2,343
Small	21 to 50	637	642	521	185	1,985
Total		1,806	1,230	1,482	733	5,251

Source: IMR Databank

In the three categories given in the table above gold mines dominate (they are more in number in each category), of the 699 mines analysed for labour employed at the end of 1988, 553 (80%) were gold mines. An analysis was also done on percentage number of mines in each labour category producing specific minerals.

Table 4

BREAKDOWN BY LEVEL OF EMPLOYMENT
at end of 1988

Designation	Labour Employed	Number of Mines	No. of Workers	% of total Employment
Micro	1 to 5	310	927	1.6%
Very Small	6 to 20	220	2343	4.1%
Small	21 to 50	63	1985	3.4%
Large	> 50	106	52446	90.9%
Total		699	57701	100.0%

Source: IMR Databank

In the micro mines category, 260 (84%) of them are gold producing and the second largest number of mines in this category are emerald mines and then chromite mines. Gold mines dominate in all the four mine categories listed above, followed by chromite, emerald and copper mines with asbestos mines being the least. Gold mines alone constitute 79% of all the operational mines which declared labour in 1988 and of these 83% are small scale producers (using classification by labour). Almost all (98%) of the small scale mines are owned and operated by either individuals, local syndicates, local private companies and the remaining 2% are owned by large mining companies. Most emerald mines are in the micro category while chromite ones are mostly large scale producers Nickel production is entirely from large scale operations. Overall, small scale mines with 50 or less employees, make-up the large number of producing mines which declared labour at the end of 1988 and they constitute 85% of all the mines.

Table 5

BREAKDOWN OF LABOUR EMPLOYED BYLABOUR CATEGORY AND NUMBER OF MINES

Design.	Labour Employed	Number of Mines for each Mineral Au	Cr	As	Cu	Em	Fe	Ni	Other	Total
Micro	1 to 5	260	4	0	2	13	2	0	29	310
Very Small	6 to 20	187	4	0	0	6	0	0	23	220
Small	21 to 50	50	5	0	0	1	0	0	7	63
Large	> 50	56	20	4	4	2	2	5	13	106
Total		556	33	4	6	22	2	5	72	699

Source: IMR Databank

Formal mining operations in general, employed 57,701 workers during 1988. Large mining operations account for over 90% of all these workers (52,446) while smaller scale mines account for about 10% of the total employment on the mines. Micro mines are the least employer, the 310 mines in this category employ only 17% of total small mines employment. Most of the workers in all categories are employed in gold mining operations, with the largest number being employed on the large gold mines. Gold mines alone account for 41% of total employment in the whole sector, followed by asbestos, then chromite, copper and the iron ore. The five nickel mines in the country employ 4,334 (7.5%) of total employment. Most, if not all, micro mines are owned and operated by local private companies, local syndicates and individuals while all the large mines are owned and operated by transnational corporations. Trans-nationals which own mines in this category include, Falcon Mines, Rio Tinto Zimbabwe, Union Carbide (Zimasco) and Anglo American Corporation (Zimalloys) with local individuals and small private companies as tributors.

Small mines employ 1,985 employees and of these 1,524 workers are employed in fifty gold mines and five chromite mines employ 189 workers in this category which consists of 63 mines. The trend in mine ownership seems to be uniform for all the three categories. In the small mines category, of the 63 mines, only seven are owned by trans-nationals but tributed to individuals and syndicates, while the rest are owned and operated mainly by syndicates and local private mining companies.

Gold mines are the largest employers even in the large mines category where 19,759 workers are employed on gold mines and only 9,792 are employed on asbestos mines with 5,613 workers being employed on chromite mines. The gold mining sector is the largest employer of all the minerals produced in Zimbabwe.

On average micro gold mines employ three workers per mine, very small gold mines on the other hand employ an average of eleven workers per mine and gold mines in the small mines category employ thirty workers per working.

The above analysis clearly shows that the small scale mining sector is dominated by small gold workings. These workings are either previously abandoned mines, dumps or fresh claims tributed from large companies. Gold mines alone employed 4,317 (82%) of the all the labour engaged in small scale mining in Zimbabwe in 1988. Small scale mines therefore form a very significant part of the whole mining sector, they employ 9.1% of the total labour force employed in the mining sector.

However, the analysis is not very representative of the degree of employment in the small scale mining sector because most very small mines seldom declare their level of employment. Figures for the first half of 1988, indicate that most of the mines which don't declare labour are the micro ones which usually employ less than five people per mine. Lack of data on small mines may be attributed to the fact that most of the small mines are seasonal and are closed at the height of our rainy season (September to February). The seasonal mines are worked by part-time agricultural workers whose engagement in mining is only during the dry season.

For the sake of accurate records there is need on the part of the Ministry of Mines to enforce the declaration of labour employed by each mine. Although there are provisions for the Ministry to levy a token fine on mines which don't declare labour, most mines do get away without declaring any labour at all, leading to an under estimation, in national statistics, of the contribution of mining to overall employment in the whole economy.

Table 6

BREAKDOWN OF LABOUR EMPLOYED BY LABOUR CATEGRORIY NUMBER OF WORKERS AND MINERAL

Design.	Labour Employed	Number of Workers for each Mineral Au	Cr	As	Cu	Em	Fe	Ni	Other	Total
Micro	1 to 5	773	10	0	7	50	10	0	850	927
Very Small	6 to 20	2020	46	0	0	46	0	0	231	2343
Small	21 to 50	1524	189	0	0	40	0	0	232	1985
Large	> 50	19759	5613	8965	3962	303	1076	4334	7612	52446
		24076	5858	8965	3969	439	1086	4334	8925	57701

Source: IMR Databank

Classification by Output

The most commonly used method of classification of mines into categories of small, medium and large is by the level of output produced by each mine.

Using classification by output for chromite mines as at the end of 1988 the following results were obtained. Of the 42 small chromite mines, eighteen produced less than 625 tons of ore in 1988 and of these only two (11%) were being worked by co-operatives and the rest were either owned by Zimalloys or Zimasco. However, 79% (19) of the 24 chromite mines producing between 625 to 5250 tons of chrome ore are run by co-operatives and of these eleven operate on Zimalloys (AAC) claims and seven on Zimasco (UC) claims. As a group small scale miners produced 10.8% (60.64 Kt) of total declared.

Of the thirteen large chromite mines, nine are owned by Union Carbide (Zimasco) and four are owned by AngloAmerican Corporation through Zimalloys. The large chromite mines produced 496.948 tons of chromite worth 40.08 MZ$.

Mining co-operatives form an important sector of thechromite producing sector in this country. By tributing from large companies claims the co-operators are able to raise their standards of living and at the same time help in the exploitation of this abundant chromite resource.

The complete breakdown of the size of chromite mining co-operatives in terms output is given below:

Table 7

CLASSIFICATION OF CHROMITE MINES BY OUTPUT AT THE END OF 1988

Designation	Tons per Yr	Number of Mines	No of Coops	Total Output (Kt)	Value (MZ$)	Value as Total Value
Very Small	0 to 625	18	2	3.831	.309	.7
Small	626 to 6250	24	19	60.635	4.889	10.8
Medium/Large	+ 6251	13	7	496.948	40.075	88.5
Total		55	28	561.414	45.273	100

Source: IMR Databank

In 1988 there were 188 operating base minerals mines and 691 operating gold mines which declared output with the Ministry of Mines. Of 691 operating gold mines 548 treated less than 5,001 tons of ore each and 113 mines treated between 5,001 and 50,000 tons of ore and the rest treated more than 50,000 tons of ore. Using classification by output, all emerald mines are small scale producers and all but one of the nickel mines is a small scale mine.

The very small mines produced 470.44 kg of gold worth 11.93 MZ$ and 116.10 kg of silver worth 0.070 MZ$ from a total of 337,467 tons of ore. Small mines produced 2788.88 kg of gold worth 70.75 MZ$ and 488.50 kg of silver worth 0.295 MZ$. The small scale mining sector altogether produced 3.259 tons (22% of total gold produced) of gold worth 82.68 MZ$ and 604.6 kg of silver worth 0.365 MZ$. The large mines produced 11.712 tons of gold and 2.348 tons of silver in 1988. The total value of gold produced in 1988 was 379.53 MZ$ and the total value of silver was 13.24 MZ$.

The complete classification of non-chromite mines which declared output in 1988 is given below:

Table 8

BREAKDOWN OF MINES BY OUTPUT PRODUCED
at the end of 1988
(excluding chromite mines)

Designation	Output Tons/Yr	Number of Mines in Each Category Total	Au	Cu	As	Em	Ni	Others
Very Small	0 to 5,000	664	548	9	1	6	4	96
Small	5001 to 50,000	136	113	1	0	0	1	21
Large	+ 50,000	79	30	0	3	0	0	46
Total		879	691	10	4	6	5	163

Source: IMR Databank-

Small miners are not as small as the name implies if we consider the volume and value of gold produced by this sector in terms of the whole industry's output. The breakdown of output from small scale miners by volume and as a percentage of national output is given below:

Table 9

SMALL SCALE MINING SECTORS' GOLD PRODUCTION
at the end of 1988

Design.	Output Tons/Yr	Ore Treated(KT)	Gold (kg)	% of total Au	Silver (kg)	% of total Ag
Very Small	0 to 5,000	337.5	470.44	3%	116.10	4%
Small	5,001 to 50,000	1301.8	2788.88	19%	488.50	16%
Large	+ 50,000	4659.8	11712.34	78%	2348.19	80%
Total		6269.1	14971.66	100%	2952.79	100%

Of the 188 base metal mines at the end of 1988, 139 of them produced less than 50,000 tons of ore and of the 691 gold mines, 661 (95%) treated ore of less than 50,000 tons. The above table clearly shows that most mines fall in the micro mines category and the n declines as the mines grow in size (depending on output).

Socio-Economic Significance of Small Scale Mining

The importance of any extractive industry lies in its strong linkages with secondary and tertiary sectors of the economy in its role as the supplier of production inputs. The role of mining in general can only be assessed by a closer look at its unparalleled support of other economic sectors; eg agriculture (phosphate for fertiliser), manufacturing (steel industries and all engineering concerns) etc.

The contribution of the small scale mining sector in Zimbabwe to mineral output and employment need not be underestimated. The sector is particularly important in the generation of employment (unskilled and semi-skilled miners), being labour intensive the sector has the ability of providing employment for the rural populace and hence tap this abundant but the under-utilised or at times unutilised resource. By providing part-time employment to the mainly agricultural rural areas, the small scale mining industry curbs seasonal unemployment and under-employment in the peasant population. By offering employment to the rural population the sector helps curb the problem of rural-urban migration and the associated pressure on urban facilities. Small scale mining offers excellent opportunities, through in-house training, for transformation of unskilled labour to skilled or semi-skilled labour and in this way contribute to basic skill formation.

The formation of mining co-operatives has had a strong bearing on the development (infrastructural) of the Great Dyke in Zimbabwe on which the 28 chromite mining co-operatives are located. Mining co-operatives have greatly contributed to the employment of cooperators who otherwise would have been made redundant by the mining companies.

Small scale mining therefore, is an important agent or catalyst in economic development, the sector provides a large cash economy within a short space of time for the small scale miners when compared to agriculture. The sector, because of the continuous cash flow, allows people in rural areas to consume, accumulate and invest at the same time, a feat which is difficult to attain in an agricultural setup given the length of the period between investment and reaping of profits ('long gestation period').

3 Government Support for Small Scale Mining

Government Policy

The dominion in and the right of searching and mining for and disposing of all minerals, mineral oils and natural gases is vested in the President. According to the Mines and Minerals Act (Chapter 165), anyone wishing to search for and exploit any mineral deposit may do so by virtue of rights acquired by him through this Act.

The process of acquiring mining rights is administered by the Mining Commissioner who is a civil servant. No doubt Zimbabwe has one of the simplest processes of acquiring mining rights. The process of acquiring mining right in Zimbabwe involves the following:

Obtaining an ordinary prospecting licence is fairly simple. This is given to any Zimbabwean adult (over 18 years old) and costs 50 Z$ and registration fees for approved prospectors costs 200 Z$, and it takes at most a day to obtain a prospecting licence. Recent increases have pushed registration fees for precious metals/ precious stone blocks and base mineral blocks pegged under an ordinary prospecting licence to 30 Z$ and 60 Z$ respectively, the fees were originally 3 Z$ and 6 Z$.

The prospecting licence allows one to prospect for the specified minerals, and to peg any block of claims (a block is one hectare)

The beacons and claims are then inspected by the Beacons Inspector and then registered for a fee which amount depends on the minerals to be produced. Accordingly, a person acquires the right to prospect and search for minerals when he purchases a prospecting licence and registers the claim, or when he is granted an exclusive prospecting order over a defined area. From this right to search for specified minerals stems the right to peg mining locations and dispose of minerals won. However, acquiring a prospecting licence does not grant someone the right to peg claims, one needs to employ a registered pegger (peggers are trained and tested by Mining Commissioner) to peg the claims before he actually starts mining.

Production regulations for miners are that mine managers should have the requisite skills and qualifications, a registered blaster should be employed (holder of a blasting licence, who has written and passed test set by CGME) and other employees need not have any specific qualifications.

Therefore, according to government policy in mining, any Zimbabwean can produce minerals provided he has acquired the mining rights by virtue of a prospecting licence and has registered the claim.

The ease with which mining rights are acquired is responsible for the numerous small mines in Zimbabwe. At present there are more than 4,500 registered mines (includes prospectors) in Zimbabwe of which 1,500 were operational by the end of 1988.

The Government also grants Exclusive Prospecting Orders (EPOs), which are like a prospecting notice, which confer rights over a much larger area for a longer period of time. The holder of an EPO has an exclusive right to prospect over, peg and register blocks of land in his or her name in the area covered by the EPO. The holder has a right to prospect over, peg and register blocks for specified minerals and for a given period which can be as long as six years and not more. An EPO holder has first priority over an area in terms of the exploitation of the mineral resources. However, existing claims on an area covered by an EPO remain in the hands of a claim holder even during the duration of the exclusive prospecting order. A claim holder can apply to an EPO holder for permission to win minerals which fall in the EPO designated area and if the mineral is not of much significance to the EPO holder permission maybe granted. On expiry of the EPO anyone becomes free to work on the area formerly covered by an EPO.

An EPO is obtained by application to the Mining Commissioner. When an application for an EPO is approved it is published in the Government Gazette and thirty days after publication of the notice the EPO holder can then peg claims and commence mining.

During 1988 31 EPOs were registered with the Ministry of Mines and all but three of them were held by TNCs through their local subsidiaries but seven of these were later cancelled for varied reasons. The distribution of EPOs as per mining district is given below:

Table 10

DISTRIBUTION OF EPOs BY DISTRICT IN 1988

District	No. of EPOS
Bulawayo	4
Gweru	11
Harare	7
Masvingo	4
Total	26

Of these EPOs only one was held by a private Zimbabwean individual covering an area of 46,800 hectares and two were held by ZMDC, a state mining company. The rest of the EPOs were owned as follows:

Table 11

OWNERSHIP OF EPOs BY TNCs in 1988

Holder	No. of EPOs
Shabanie & Mashaba Mines (TN)	1
Blanket Mines (1983) (Falconbridge)	5
Cluff Mineral Exploration (Cluff)	5
Rio Tinto Zimbabwe (RTZ)	5
Chase Minerals (Chase)	7
Zimasco (UC)	1
Total	24

Chase Minerals (Pvt) Ltd, a subsidiary of an Australian mining company held seven EPOs with a minimum area of 3,638 Ha. The total area covered by EPOs in 1988 was 583,000 Ha. For unknown reasons of these EPOs none are held by small scale miners.

Although mining is primarily in private hands, the task is made easier for their prosperity by relatively low operational costs, availability of raw materials and free technical consultant services in geology, mining engineering and metallurgy supported by Government with financial assistance available for small scale mines on fairly reasonable terms.

The existing Government regulations encourage investment in mining by both local and external companies and individuals. For external investors, the government may allow them to repatriate their capital and recoup direct investment upon approval by the Zimbabwe Exchange Control after a maximum period of seven years. In addition, profits and dividends based on current income may be repatriated. These concessions by central Government are responsible for the impressive overall participation in the mining industry by TNCs, local private companies and small scale miners.

The fiscal regime makes a distinction between individual smallworkers and large mining corporations. The income tax payable by companies is fixed at 45% per dollar of taxable income. Special allowances for mining companies as opposed to trading and manufacturing ones have been written into the taxation law with the growth of the industries in mind. Individual smallworkers have in addition special allowances and exemptions. Capital reduction allowance are made on the estimate of the life of the mine (which is the same for large mine-owning companies) or they can accept an allowances that the Mining Commissioner deems fair and reasonable on plant and machinery, buildings among other things. In addition, individual miners can take advantages of the normal abatements for single people and family taxpayers.

The Ministry of Mines

The Ministry of Mines was established under the Mines and Minerals Act (chapter 165) with a view to administering, supervising and controlling the exploitation of minerals in the country. The main function of the Ministry is to administer the Mines and Minerals Act (Chapter 165), the Gold Trade Act (Chapter 164), and the Precious Stones Trade Act (No. 8 of 1978), and regulations under these laws.

Prospecting and exploration rights are obtained by application to the Mining Commissioner in any one of the four mining district offices located in Harare, Bulawayo, Gweru and Masvingo. Each mining district has a District Advisory Board established by the Minister as required by the Mines and Minerals Act (Chapter 165). The Board in each district consists of; a mining commissioner, regional mining engineers, regional geologists, regional metallurgists, representatives from mines and an accountant. The function of the Board is to recommend to the Minister through the Secretary for Mines, special grants (mining titles offered in a reserved area), prospecting grants, mining rights, tribute agreements and loan applications.

The Government, through the Ministry of Mines, provides both financial and technical assistance to any mining house through its several departments but special attention also accorded to small mines and co-operatives. The departments exist to render free consultative services pertaining to the mining engineering, geological surveying and metallurgical laboratory work. The services are offered by the following departments within the Ministry of Mines; Chief Government Mining Engineering, Government Metallurgical laboratory, Roasting Plant, Institute of Mining Research, Zimbabwe Mining and Development Corporation and Minerals Marketing Corporation of Zimbabwe.

The Ministry also operates FOREX allocation schemes for the benefit of the mining sector, for both ad hoc and projects. The project funds, both Export Revolving Fund (ERF/MEPP) and Mining Continuation Reserve (MCR) are for the purposes of importing front-end loaders, bulldozers and hoists, while the ad hoc fund covers recurrent expenditure and machinery, spare parts, accessories, tools and drills. Both the MEPP and MCR are at the disposal of mining companies, small mines and co-operatives but unfortunately most of the FOREX is taken up by the large mining companies.

Within the Ministry there is the Mining Promotion and Finance section whose function is to administer Commodity Import Programmes to the extent that they relate to the Mining Industry. In addition, the Minerals Development Unit carries out research in mining matters, feasibility studies and economic appraisals, moni-

toring production trends and marketing. By analysing the performance of individual minerals and formulating development projects to potential investors, the unit helps small workers engaged in mining.

As a special service to small miners the Ministry of Mines every year offers about 2,000 Z$ worth of prospecting grants available to small miners but very few are taken up because of ignorance about the existence of such a facility. However, since the publication of the first mining newsletter by SSMAZ awareness has been raised and more small miners now take advantage of this facility.

Department of Mining Engineering

The department is made up of mining engineers, mechanical/electrical engineers, technicians and mine surveyors all of whom offer free services to the Zimbabwe mining industry. The department operates through regional offices located in Harare, Gweru, Bulawayo and Masvingo and also through sub-offices in Chinhoyi, Kadoma and Hwange. The major objectives being to monitor the application and interpretation of the Mining (Management and Safety) Regulations, 1981 and the Explosives (Licensing and Use) Regulations, 1970.

The department offers advisory service to small miners, including free surveying, sampling, mine inspection with emphasis on mine safety, management and sanitation for the small miners. In addition, the department carries out feasibility studies on mines for loan applications and controls the manufacture, storage and transportation of explosives necessary for mining. The department conducts Blasting Licence Examinations and also offers examinations for Surveyors' Certificate of Competency and the Mine Managers Diploma (lower).

As a service to mining cooperatives, the CGME's department was assisted by the ZMDC in successfully introducing underground mining at Ingezi Chrome-mining Cooperative. Mechanised mining at Ingezi co-operative has successfully solved the problems of flooding experienced on open pit mines during the rainy season. This mine will serve as a model for projects to be undertaken country-wide.

The department operates a plant hire scheme under the auspices of the Chief Government Mining Engineer (CGME). The mining community, especially the small scale mining sector which cannot procure its own equipment easily because of lack of finance has access to mining and metallurgical equipment at three depots in Harare, Gweru and Bulawayo. The facility is open to small scale mines on a hire-to-buy basis. The scheme is administered as revolving fund called the Mining Industry Loan Fund being controlled by the CGME. According to the existing regulations, any person having a 'reasonably' viable mining venture as determined by Regional Mining Engineers may apply to hire the item or items of equipment on a hire-to-buy scheme. Mining equipment available for hire includes, compressors, air hoists, tracks, pipes, percussion drilling machines, cocopans and skips and ball mills (only small) and flotation cells. The equipment is hired out against a deposit equivalent to 3.5% of the value of the hired item(s), the hire charges are set at a rate which enables the hirer to pay-off the capital cost plus interest of 10% per annum over a maximum of 3 years. This is fairly reasonable and enables small scale mines to take advantage of the available equipment given their limited ability to buy the equipment directly. Like any other hire purchase agreement, ownership of the equipment remains vested in the Ministry of Mines through the CGME until the last instalment has been paid. In addition, maintenance of the equipment is done by the Mines Department until the equipment is fully paid for.

Other forms of financial assistance include prospecting grants, development loans and establishment loans which are obtainable from the Ministry through CGME. The department participates greatly in the negotiation of loans for the small scale mining sector from the Ministry of Mines. However, for one to qualify for these loans, the CGME has to assess the claims and their economic viability. Through an Internal Committee on Foreign Exchange allocations, the engineering department processes applications for forex for all mining houses.

The department intends to open a ventilation laboratory in Gweru for the purpose of analysing all gases and substances that may be harmful to miners. The proposed laboratory will be accessible to the whole of the minerals industry.

On paper the department seems to be offering all the required service and equipment to the small miner but in reality most of the department's functions are not met. There is actually a discrepancy between what mines would actually require and what the department offers. Of the equipment that the department is supposed to offer to the small miners only old tracks are available, compressors and hoists are non-existent because of the shortage of foreign currency to import these necessary machines. Donor agencies would help the CGME in general and the small scale miners in particular if they helped in the procurement of the machinery and spares or actually supplied the machinery to the small miners. The shortage of safety equipment, however, remains a major stumbling block to the department, due mainly to the perennial shortage of foreign exchange.

The department also faces an acute shortage of manpower to effectively monitor the progress of small miners. For instance one regional geologist in a district like Harare which has more than 690 registered mines does not ensure efficient services to all mines. The geologist will not have time to visit all the mines in one year given that effective consultation requires more than a week on one mine.

The Department's workshops at the regional centres

have embarked upon the fabrication of vital items of mining equipment, such as coco-pans, portable explosives magazines, gold extraction boxes and trommels; an import-substitution strategy.

Department of Metallurgy

Established by Government in 1928, the department participates in the provision of facilities for R & D particularly affecting extraction, processing and industrial utilisation of the mineral resources by small, large and medium scale mineral producers. The department provides an important metallurgical and assay facility for the whole mining industry. The department also has a physical metallurgy and ceramics section which deals mainly with import substitution of metallic and ceramic products. This section mostly serves the metallurgical and ceramics industry in both import substitution and export promotion programmes.

Metallurgists in regional centres assist the small mines in solving metallurgical problems and identify problems that can be solved in the laboratory. Its pilot plant provides for crushing, flotation and separation of ores by gravity and electromagnetic methods. This is complemented by a workshop, a wet-chemical laboratory, and a fire assay laboratory capable of over 200 determinations a day for the whole minerals sector.

The main function of the GML is to determine the recovery of a wide range of valuable minerals which exist in the country. The evaluation of gold ores and dumps, and of pegmatite minerals has been particularly important, but the facilities for froth flotation have been employed extensively.

The GML serves the small scale mining free of charge. The department is also responsible for the Roasting Plant in Kwekwe. The department's physical metallurgy laboratory, established through a generous United Nations Development Programme grant, will be fully operation at the end of 1990 and will conduct research and development of substitute local materials for specific applications.

Three regional metallurgists each based in Harare, Bulawayo and Gweru offer metallurgical assistance to the small scale mining community. There is need to decentralise the services of the regional metallurgists, maybe by sub-dividing the mining, districts with each sub-district having a metallurgist to effectively work with the small miners and hence maximise the provision of this important facility. There is an urgent need to expand the manpower resources of this department, since at present it takes at least two working weeks to have results from the GML and this inconveniences the small miners. The Ministry faces major manpower constraints to efficiently run the GML in all districts and sub-districts.

Geological Survey Department

The department was established in Bulawayo in 1910 and then offices were set-up in other mining regions. The Bulawayo School of mines supports the Geosurvey department by training personnel. The primary task of the Geological Survey Department is to assess the mineral potential of the country through detailed mapping. The department produces publications and maps, and offers consultancy, mineralogical, chemical and spectrographic services to prospectors and small miners.

The department has other facilities which include, a library housing technical files and expired exclusive prospecting orders (EPOs) and final reports, a chemical analysis laboratory, mineralogy section, cartography section and a geo-physics section. Information on redundant EPOs is available to all mining companies and individuals.

The chemical analysis laboratories provide services in emission spectroscopy and silicate analysis.

Mineral resources of the country can be assessed using a Remote Sensing Unit available in the department.

Roasting Plant

The Roasting plant was established in 1938 and has the following functions:

1) the recovery of gold from refractory gold bearing concentrates;

2) the production of marketable arsenic trioxide;

3) gold and silver analysis for mines in the Mid lands area;

4) the refining of silver for the jewellery and the electroplating industry.

The plant produces an average of 520 kg of gold annually, accounting for 3.5% of Zimbabwe's total production. The importance of the Roasting plant as a foreign currency earner is significant and its location in the refractory gold mining district of the Midlands is strategic particularly to the small scale miners who operate in that area and don't have the financial resources to carry out their own recovery of gold.

Institute of Mining Research

The Institute of Mining Research, a department within the Faculty of Science at the University of Zimbabwe was established in 1969 with the purpose of carrying out research for the benefit of the mining industry. The IMR receives considerable support from the departments of Mining Engineering, Metallurgy, Chemistry, Geology and Geophysics also at the University of Zimbabwe. The IMR is financed by an annual grant

from the Ministry of Mines and, in addition, income from bilateral arrangements helps supplement the grant from the Ministry.

As a full-time research department, the IMR has, over the years developed a multi-disciplinary R & D team which is supported by an important facility in chemical analysis. The chemical analysis laboratory produces more than 180,000 determinations each year, half by XRF. The coal laboratory at the IMR offers a comprehensive coal analysis facility in the region.

The IMR has diverse facilities for carrying out research for small scale miners, large scale mining concerns, Government related projects and for the whole SADCC region's mining sector. Research covered at the IMR includes rock mechanics, applied mineralogy, economic geology, applied geo-chemistry, mineral processing, mineral economics and extractive metallurgy. The purpose of the research is to investigate unusual problems confronting the minerals industry with the view of overcoming them. The analysis of data has led to important contributions to import substitution as well as to industries concerned with quality control of raw materials and primary products. The IMR also has a comprehensive bibliographic database (IMMAGE) from the Institute of Mining and Metallurgy (IMM) in London on earth sciences, mining and metallurgy.

One of the most important contributions of the IMR is the "unpackaging" of technology. In this regard the IMR is regularly consulted to assist in the resolution of problems related to the local adaptation of imported mining and manufacturing technology.

The services offered by the IMR are available to all sectors in the minerals industry at relatively low rates. However, the IMR faces acute staff problems to carry out research on behalf of the mining sector, of the 13 established research posts, only five are presently filled. More should be done in the way of training and attracting staff to the Institute.

Zimbabwe Mining Development Corporation

In view of the mining sector's vulnerability to world economic conditions and its potential contribution to development, arising from the wide range of Zimbabwe's mineral resources, it is Government policy objective to increase value added in this sector, and increase the sector's linkages with secondary industry (down-stream industries). The Government has, through Acts of Parliament, set up two parastatal, The Zimbabwe Mining Development Corporation and The Minerals Marketing Corporation of Zimbabwe in order to effectively help the Zimbabwean minerals industry.

The Zimbabwe Mining Development Corporation was established in 1982 (Act No 31 of 1982). The ZMDC provides an important extension to the old Mining Promotion Corporation (MPC), a subsidiary of Industrial Development Corporation (IDC) established in 1967.

The main tasks of the Corporation include:

i) Planning, co-ordinating and implementing mining development projects;

ii) Engaging in prospecting, exploration, mining and mineral beneficiation programmes;

iii) Encouraging the formation of mining co-op eratives;

iv) Rendering assistance to persons engaged in, mining;

v) Investing in mining on behalf of the state.

The corporation participates in mining through; Mhangura Copper Mines (MCM), Lomagundi Smelting and Mining (LSM), Kamativi Tin Mines (KTM) and Sabi Consolidated Gold Mines.

In addition, the Corporation is also gearing itself for a major thrust in industrial minerals and in this regard they are prospecting the diatomaceous earth deposits in Chemutsi at the base of the Zambezi escarpment. ZMDC is currently in the process of undertaking geological exploration at various small scheelite mines and molybdenum prospects in Chiredzi.

The Corporation operates a fully staffed R & D laboratory which carries out fire assays and wet chemical determinations and gives technical assistance to the small scale mining sector in general and to mining co-operatives in particular. The assistance given to mining co-operatives includes among other things, advice on the Mines and Minerals Act (Chapter 165), advice on the Cooperative Societies Act (Chapter 193), technical services (mine ventilation and planning), legal advise, marketing and distribution of produce and offers manpower training to co-operatives and small mines.

The ZMDC Resident Co-operative Advisors assist the mining co-operatives in technical and business management matters on a day to day basis. Liaison meetings are initiated by the ZMDC to facilitate solution of problems that arise between the farmers (on which the mines are situated) and the co-operatives and the two parent companies (Union Carbide and Anglo American Corporation) who own the claims.

Minerals Marketing Corporation of Zimbabwe

Established in June 1982 under the Minerals Marketing Corporation of Zimbabwe Act, the Minerals Marketing Corporation of Zimbabwe (MMCZ) became operational in 1983. As established under the act, the prime function of MMCZ is to export, sale and stockpile all minerals and metals produced in Zimbabwe except gold.

The corporation advises Government and producers on market conditions and on further prospects for those minerals already produced. The bulk of the corporation's business is conducted as agent for producers except for gemstones and some industrial minerals such as scheelite, wolframite, tantalite, commercial beryl and cassiterite, which the corporation buys on its own account for resale abroad.

Small scale producers sell their ores to MMCZ and only pay the costs of delivery and assaying at the warehouse in Msasa. The only ores that are brought to MMCZ from small producers regularly are beryl, tantalite, cassiterite, scheelite and wolframite. Unfortunately, the MMCZ does not serve the abundant gold miners because gold is marketed through the Reserve Bank of Zimbabwe (RBZ).

Before 1982 marketing was done by the companies, usually through agents in the OECD countries. Up until the beginning of 1980 sanctions were applied to the then Rhodesia, so the marketing methods tended to be somewhat devious and clandestine. Since 1983 all mineral exports, except gold, have been controlled by the Minerals Marketing Corporation of Zimbabwe (MMCZ) which was set up by government in 1982 to rationalise selling arrangements, remove restraints on the minerals trade and to reduce costs to producers. In 1988 it made an operating profit of 3.29 MZD on a total revenue of 7.96 MZD. Its income is mainly derived from commissions on sales of 814.2 MZD in 1988.

It was initially received by the industry, especially the TNC's with great foreboding, but over the last decade they seem to have come to terms with it, particularly as, in some instances, higher prices have been obtained and middlemen have been eliminated and, in many cases, the old agents and channels are still being used. There have however been well-documented instances where the old agents have been receiving inflated commissions and have not always managed to obtain the optimal world market price for the minerals sold.

In 1989 the MMCZ bought into two of the principal agencies in Switzerland, Salg and Gencom of Zurich, for over one million Francs, and formed a new company called MMCZ Sales AG in which it holds 50% of the equity with an option to increase the holding to 100%. The main reason for buying these Swiss agencies rather than setting up their own, was to acquire the skilled personnel in the two companies. Also, half of all profits coming from commissions on Zimbabwean minerals sold will now accrue to MMCZ.

Reserve Bank of Zimbabwe

The acquisition and disposal of gold is the sole responsibility of the Reserve Bank of Zimbabwe (RBZ). Gold produced is sent to the RBZ through three channels depending on the size of the mine. Large gold producing companies deliver their gold directly to the bank under the producer bar system. The bank's bar system is mainly for small workers and gold produced at any mine is deposited under this scheme with any branch of Barclays Bank where the small base bullion bars are check assayed and blended into composite bars which are then dispatched to RBZ.

Gold, which is still produced by numerous small mines, with bulk production from medium sized ones, surpassed and replaced asbestos in 1979 as Zimbabwe's most valuable mineral. On the export market, it is a valuable foreign exchange earner and is counted as part foreign currency reserves, due to its quick convertibility into foreign currency through its instantaneously responsive market.

To stimulate gold production and to hedge producers against the risk of the falling into international price, a stabilization policy, in form of an "Equalisation Account" was set up by the Reserve Bank of Zimbabwe in November 1984. The modus operandi of the scheme is to subsidise the producer when prices are low and obtain a certain percentage of the price when prices are high. The Reserve Bank sets a floor price. When the market price is below the floor price, the bank offers producer the floor price (fixed), and therefore the difference between the market price and the floor price constitutes a subsidy, from the equalization account.

When the market price rises above the floor price, the producer obviously gets the market price. But producers need to contribute a percentage (tax) of the amount by which the market price exceeds the floor, to the equalisation account, in order to fully pay back the debt created in periods of low market price.

The equalisation account shows that between 1/11/84 and 8/8/85 the total gold subsidy amounted to 5,6 MZ$. During this period, the floor price was set at Z$500 per troy ounce, and the average market price was Z$478 per troy ounce and Z$512 per troy ounce, in 1984 and 1985, respectively.

The producers are taxed 25 per cent of the difference between the market price and floor price, in times of high market prices. On the basis of this tax the subsidy registered in 8/8/1985 was completely paid off on 7/71/1986.

In February 1987 a subsidy of 15,5 MZ$ was paid to producers, and this amount was paid off by 31 March 1987.

The account is "closed" when the subsidy is fully paid up, that is, when the balance is zero, warranting its coinage of an "Equalisation Account".

The gold stabilisation scheme has indeed supported production, since the producer realises a high price even though market forces would have resulted in a low price. Miners however, wish the current floor price were

higher at Z$1 000 per troy ounce rather than Z$950 per troy ounce. Even with the Z$50 difference the scheme is still supportive. What could stifle gold production are input constraints rather than the price.

The present arrangement is that the RBZ pays the producer (small or large) 950 Z$ per troy ounce of gold supplied. When the official price rises beyond 950 Z$/ troy oz the RBZ recoups its expenditure at the rate of 25% of the increase in price. A guaranteed minimum price of 950 Z$/troy ounce undoubtedly benefits all gold producers, including small miners and cooperatives.

However, small scale miners are not happy with this scheme, to them the floor price is very low and also the time taken for income receipt is rather long and inconvenient. Small miners require instant income since most of them live from hand to mouth. The delays encountered with this marketing strategy are responsible for the lucrative illegal trade in gold which often pays more and instantly.

Other Departments

Other support to the small miners is provided for, indirectly, by the Departments of Geology, Chemistry, Mining Engineering, Metallurgy and Geophysics at the University of Zimbabwe in Harare. The School of Mines, at the Bulawayo Technical College, trains mining and metallurgical technicians and mining surveyors who then join the mining sector. Courses offered at the School of Mines include: mine surveying, mineral processing and extractive metallurgy. Unfortunately graduates from the University are only interested in working for the large mines only and hence the small miners rely on the few graduates from the School of Mines who are not tempted by the high salaries in large companies. However, the School of Mines staggers from staffing crisis to staffing crisis, principally because of non-competitive wage and salary levels and this restricts the number of students at any one time and reduces the output of graduates to help small and large scale miners.

In addition, management courses for learner mine officials are also run at the Bulawayo Technical College. The Ministry of Co-operative Development under which co-operatives are administered plays an important role in the smooth running of mining co-operatives by providing management courses.

Peacock Simpson and Associates, Anacal, Geomet offer consultative services in metallurgical, geochemical and mineralogical spheres for the small scale miners. Anacal, a subsidiary of Peacock Simpson and Associates specialises in gold analysis by cyanidation for small scale miners.

4 Non-Government Support to Small Scale Mining

Introduction

Although the bulk of the framework within which the small scale mining sector operates is provided for by the Government, the non-government sector also does have a role to play in the development and proper management of small mines. Small scale miners obtain invaluable assistance from; Small Scale Miners Association of Zimbabwe (SSMAZ, the major coordinator), Chamber of Mines, Associated Mine Workers Union Of Zimbabwe (AMWUZ), Zimbabwe Congress Of Trade Unions (ZCTU) and the Co-operative Union.

There is however, need for the non-government sector to expand its aid to the small scale miners to cover such areas as the provision of financial resources and where possible the provision of management training and technical back-up. Lack of adequate finance is one of the principal constraints hampering the expansion and proper function of this vital economic sector. Borrowing requirements could also be made conducing to accommodate the small miner so that financial resources are made available for purchase of mining equipment.

Chamber of Mines

The Chamber of Mines does not have any well set out links with all the small scale miners in general but according to the rules governing the operation of the chamber, any miner can join this association. All large mining companies are members of the chamber and so are small scale mines owned by these companies.

The Chamber, however has regional divisions which deal with the small miners in the four mining districts. The Small Workers and the District Mining Associations are groupings of predominantly white small miners falling under the Chamber. These district mining associations are intended to serve as a link between the small workers and the Ministry of Mines through the Chamber of Mines. This category of small workers does not require any assistance from ITDG and SSMAZ because the miners are self-sufficient.

As a service to members, the chamber publishes a monthly bulletin which is circulated to all fully subscribed members of the association, the bulletin informs and educates members about current developments in the mining sector (eg. any changes in mining legislation). In addition, the chamber also informs, through the monthly report, members of professional examinations in mining being undertaken and the dates. Unfortunately not many black small miners are members of these district associations which fall under the chamber, more should be done to encourage multiracial participation since the Chamber is a larger and better endowed association than the SSMAZ.

District small scale mining associations falling under the Chamber go a long way in helping their members in overcoming problems experienced at the mines. One of these associations, the Matabeleland Small Scale Miners Association (MSSMA) has proposed to establish a central gold milling and mining service centre on a collection of small claims in the Filabusi area. This project has been approved by the MoM and an international donor has been approached to sponsor the project which will cost about 300,000 Z$. However, the international donor is still considering its contribution to the project.

Small Scale Miners Association of Zimbabwe

The Government's open door mineral exploration policy has resulted in the registration of 4,500 claims by the end of 1988, the majority of them small miners. In spite of this favourable Government policy, the small miner competes for claim holdings and development loans with external investors and some EPO holders.

In order for small miners to assert themselves meaningfully and economically they set-up the Small Scale Miners Association Of Zimbabwe (SSMAZ) in 1982 which has its head-office in Harare.

The main objective of the association is to look after the interests of small scale miners nationally. The SSMAZ also aims at promoting, supporting and strengthening small scale mining in Zimbabwe and doing everything necessary to fulfil the following objectives as spelt out in their constitution:

i) to perform as an information and advisory centre for small scale miners,

ii) to provide training to operating and prospecting miners;

iii) to identify, appraise and promote small scale ventures;

iv) to perform as an investor in small scale mining ventures for the direct benefit of the members;

v) to articulate and promote interests of its members;

vi) to render any assistance to small scale miners and the mining industry as a whole in Zimbabwe to ensure the fulfilment of the above objectives.

Membership of the association is open to individuals, companies, syndicates and families provided they meet the following conditions;

i) the person holds a valid prospecting licence;

ii) the person owns a mine or is a representative of a mine in Zimbabwe;

iii) the person is connected with the mining industry;

iv) the person should be prepared to pay member ship dues.

According to the SSMAZ, there are three types of members and these are;

i) Subscribing- any person who has applied for and has been granted membership in terms of clause (i-iv) above and paid his subscription.

ii) Honorary- any person to whom SSMAZ has conferred membership in a General Meeting (GM) acting on the recommendations of the National Executive Committee (NEC).

iii) Patron- any person, corporate entity, organisa tion or association to whom the SSMAZ has conferred membership in a GM acting on the recommendation of the NEC.

According to the SSMAZ constitution, therefore, membership is open only to people legally involved in mining on a small scale (small scale mines are to them, mines employing a maximum of 35 workers, but this is currently under review). Any registered small scale miner becomes a member by virtue of paying a membership fee of 20 Z$ for small miners and individuals in Zimbabwe (this includes a year's subscription for Mining News) and 40 Z$ for local large mines and institutions. Subscription for Mining News for non-Zimbabwean but African individuals and small miners is 10 US$ and 40 US$ for large mines and institutions. For non-members outside Africa, small miners and individuals pay 20 US$ and large mines and institutions pay 40 US$ for the newsletter.

Currently there are about 4,000 small scale miners belonging to SSMAZ of which 1,500 are active members (currently producing minerals) while the rest are aspiring miners or prospectors.

As a service to its registered members the association holds seminars about three times a year at which miners meet with geologists and mining commissioners and are given advice on mining laws, finance, management and safety precautions at the mines. In 1988 personnel from the British Geological Survey (BGS) was invited to address a workshop on identification of different rocks, the geology of gold and gold mineralisation and also demonstrated the use of analysis equipment developed by BGS and suitable for small miners.

Ideally, to be effective, there is need on the part of the SSMAZ to hold these consultative meetings once every month but due to a combination of both finance and lack of manpower this is impossible. Fortunately, Intermediate Technology Development Group (ITDG), a British non-governmental organisation has, in principle, agreed to employ a permanent member to run mining and safety courses for the benefit of small miners. These courses when fully implemented will fall under the auspices of the President of the SSMAZ with assistance from ITDG.

The association produces a monthly newsletter, Mining News, which is circulated to all fully paid-up members. The newsletter which is published in English, Shona and Ndebele informs the members about new developments in mining, any changes in mining legislation (eg. Mines and Minerals Amendment Act 1987, which encouraged the more productive use of claims and to decrease speculation in mining claims) and of any mining workshops to be held. Included in the newsletter are adverts on mining equipment supply companies from which small miners and obtain equipment.

Lack of finance once caused the temporary suspension of the production of this monthly newsletter. Fortunately, ITDG came to the rescue of the SSMAZ and agreed to finance the printing of more issues of this newsletter. However, there is a great need on the part multi-lateral granting institutions to guarantee continuous funding for this publication, also expand the level of assistance to the SSMAZ on all operational aspects including the payment of the President's salary who at present is a full-time non-salaried worker.

The association has a national executive committee headed by a President, who together with thirteen other committee members is elected by fully-paid-up members. The organisation operates mainly through members' subscriptions.

Associated Mine Workers Union

As an arm of the Zimbabwe Congress of Trade Unions (ZCTU), the Associated Mine Workers Union of Zimbabwe stands to represent all workers in legal mining operations in Zimbabwe, both on a large scale and on a small scale. The AMWUZ through its labour officers educates the mine workers on their rights as workers and on how to settle disputes at their work places. Where workers are engaged in disputes with their employers, the AMWUZ takes the concerned employer to court and represents the workers or appoints lawyers on behalf of the workers.

However, according to AMWUZ officials, not many small miners are members of the AMWUZ. The association is doing all within its means to educate the mine workers about the importance of joining the AMWUZ. Plans are however underway to step-up education about the merits of being AMWUZ members, this is being done in close liaison with SSMAZ.

Cooperative Union

The objectives of the co-operative union in Zimbabwe are defined in the co-operative by-laws as;

1) to carry out mining operations on a co-operative basis with the aim of improving members' standard of living.

2) to promote the social and economic interests of its members in accordance with the co-op erative principles and to provide collective fa cilities.

3) to investigate, establish or obtain training facilities and to provide training in useful skills required in mining operations to suitable members of society.

4) to provide services of charitable and welfare nature not otherwise available to members, and

5) to promote and stimulate the spirit of co-op eration and collective effort.

According to the by-laws, anyone over the age of 18 years can become a member of any co-operative (mining co-operatives are included). On management of mining co-operatives, the by-laws state that there shall be a managing committee consisting of seven members of the society over the age of twenty one years with one of them as chairperson. The committee members are elected by the general meeting annually at which one third of the membership will constitute a quorum.

The Mining Regulations stipulate that no mine shall operate for a period exceeding seven months after commencement of mining operations without a mine manager. The appointment of a mine manager is done in consultation with the CGME, who after satisfying himself that the would-be manager has the requisite qualifications declares him appointed. The manager is supposed to perform the functions of planning, organising, leading and controlling the mine operations. In this way the Government ensures that mining co-operatives are managed efficiently to the benefit of all members and their dependents.

The Government, through the ZMDC encourages the formation of mining co-operatives provided they operate within the parameters detailed in the Mining (Management and Safety) Regulations, 1981 as discussed above. There are 43 registered mining co-operatives, of which 28 are engaged in chrome mining. Twenty-two of the twenty-eight chromite mining co-operatives are located on the North Dyke, Mutorashanga, four at Ngezi in the Kadoma District and two at Lalapanzi in the Midlands Province. There are eleven cooperatives still prospecting for a variety of minerals and in the Mazowe Valley area, four gold-panning cooperatives are registered. Most co-operatives are engaged in thin seam mining on the Great Dyke right from Ngezi to Mvurwi excluding the podiform deposits of Shurugwi (Union Carbide) and Inyala (Anglo American Corporation). Of the 22 chromite claims worked by cooperatives on the North Dyke, fifteen are owned by Zimalloys (AAC) and two are owned by Zimasco (UC), Zimasco owns another two at the southern end of the Dyke and the remaining four are owned by the cooperative members themselves.

As mentioned above, most co-operatives members work from established mining villages, on company claims for which they pay royalties, and while making use of parent company infrastructure. At some mining locations mining companies actually rent equipment at nominal rates to the co-operators. There are five other co-operatives working claims in places with no infrastructure and these have built traditional houses and apply the simplest methods of mining, pig rooting, which involves digging shallow trenches along chrome outcrops. Such co-operatives require attention so that co-operators can raise their output and welfare.

However, the co-operatives have not been without their own problems which have hampered the successful performance of these mining ventures. The major problems faced by cooperatives are management, generally there is a lack of experienced personnel to run the ventures efficiently and in addition members of the co-operatives do not seem to have adequate knowledge as to the purpose and effective management of their own resources. Even where funding has been provided there has been misuse of these funds, hence there is need to step-up training programmes on proper financial and human resources management.

Training could easily be obtained by the co-operatives if they were members of the SSMAZ, but unfortunately co-operatives are not members of this grouping at all. The degree of training could be enhanced through the funding of courses to be run by the SSMAZ for the benefit of small miners. Through the co-operative union members should be encouraged to join the SSMAZ and labour unions so that their grievances can be tackled jointly.

Financial resources are a major source of concern for mining co-operatives, they don't have access to loans from financial institutions because of lack of collateral security. Finance is required in the form of loans or soft-loans for the purchase of mining equipment or the actual machinery could be donated to the co-operative ventures to sustain them.

More attention should also be focused on the provision of amenities at the mining locations which at present are non-existent at some mines. Most co-operative mines lack proper housing and sanitation facilities (including clean drinking water) and proper roads. The infrastructure, both physical and institutional should be im-

proved on mines to enhance production and general welfare of the co-operators. There is need to diversify activities at mining co-operatives, women should be provided with resources to engage in productive work rather than house-keep, engage in alternative sources of income to substantiate the meagre mining income which is determined by the mining companies (Zimalloys and Zimasco) and depends on the grade of ore mined.

5 Conclusion

The prosperity of the mining sector in Zimbabwe then becomes unquestionable given the amount of effort by both Central Government and the private sector to help this extractive industry. Because of the invaluable importance of the mining sector the Government has formulated its fiscal policy to protect this 'golden goose that lays the golden egg'. The setting up by Government of machinery to monitor the welfare for the mining sector with particular attention being given to the small miners has greatly helped expand the mining sector and bring with it increased output and consequent benefits. However, there is need on the part of the Government to help to a very large extent the small mines in as far as mining safety, health and provision of ancillary services mines is concerned. Small scale mines, because of their risky nature, are responsible for many deaths occurring at mine sites due to rock falls and therefore, Government should, at all costs, increase efforts to curb this rather unhealthy state of affairs. Government should actually make it an offence for a mine to operate without a clinic or hospital nearby to try and reduce deaths from mine accidents. According to the Chamber of mines the incidence of accidents is higher in the group of small mine workers and the Chamber strongly recommends that more should be done to improve mine safety.

More attention should also be focused on the financing of this sector, through encouragement to banks (especially the Zimbabwe Development Bank) to relax their policies and lend money to the small scale miners for the procurement of machinery and spares. Clearly more resources need to flow into this sector in the same way that resources have been poured into small scale agriculture with such success.

Gold panning has become a problem in Zimbabwe's minerals industry, the Government actually loses a lot of foreign currency due to this practice. Efforts should be concentrated in identifying the causes of this practice and seeking tangible solutions which cater for the social fabric which relies on the illegal but lucrative trade for survival.

Small scale mines are an integral part of Zimbabwe's socio-economic setup and their prosperity inevitably ensures high standards of living for about 10% of all mining labour. Therefore more should be done to keep this sector at maximum production capacity by way of increased financial assistance.

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Regional Office for Southeast and East Asia
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